

**Amendments to the Claims:**

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An electrolytic phosphate chemical treatment method of forming a film composed of a phosphate compound and a metal that is reduced and precipitated from an ionic state on the surface of a metal material article to be treated, comprising:

performing the electrolytic treatment on said metal material article in a phosphate chemical treatment bath by contacting said metal material article having electrical conductivity with said phosphate chemical treatment bath containing phosphate ions, phosphoric acid, nitrate ions, metal ions that form a complex with the phosphate ions in said phosphate chemical treatment bath, and metal ions for which the dissolution-precipitation equilibrium potential at which the metal ions dissolved in said phosphate chemical treatment bath are reduced and precipitate as metal is equal to or greater than -830 mV, which is the cathodic reaction decomposition potential of water when indicated as ~~the hydrogen a~~ hydrogen standard electrode potential, wherein

the phosphate chemical treatment bath has a pH of less than 2 and is substantially free of metal ions, other than those which are a component of the film which will form sludge;

Fe is present and ~~the an~~ amount of Fe ions dissolved in the phosphate chemical treatment bath is controlled by changes in the amount of Fe ions dissolved into the phosphate chemical treatment bath from a Fe electrode or a metal material article to be treated of a steel material;

NO<sub>2</sub> and/or N<sub>2</sub>O<sub>4</sub> gas is ~~substantially~~ separated from the phosphate chemical treatment bath; and

the oxidation-reduction potential (ORP) of said phosphate chemical treatment bath indicated as the potential relative to ~~a standard~~ the hydrogen standard electrode, is maintained at 770 mV to 960 mV, and is used to monitor the phosphate chemical treatment bath.

2. (Currently Amended) The electrolytic phosphate chemical treatment method according to claim 1, wherein said electrolytic treatment uses for an electrode material that dissolves in the phosphate chemical treatment bath the metal ions that form a complex with ~~the phosphoric acid~~ a phosphoric acid and the phosphate ions in the phosphate chemical treatment bath, the metal material article for which the dissolution-precipitation equilibrium potential at which the metal ions dissolved in the phosphate chemical treatment bath are reduced and precipitate as the metal is greater than or equal to -830 mV, which is the cathodic reaction decomposition potential of water when indicated as the hydrogen standard electrode potential, or a metal material that is insoluble during the electrolytic treatment.

3. (Currently Amended) The electrolytic phosphate chemical treatment method according claim 1, ~~further comprising dissolving an~~ wherein the amount of Fe ions dissolved into the phosphate chemical treatment bath provides that in order to make said ORP of the phosphate chemical treatment bath equal to or greater than 800 mV and maintain is 800 mV to 960 mV and maintains the amount of Fe ions within a solubility limit of  $\text{Fe}^{3+}$  ions.

4. (Currently Amended) The electrolytic phosphate chemical treatment method according to claim 1, wherein ~~the method further comprises dissolving an~~ the amount of Fe ions dissolved into the phosphate chemical treatment bath ~~so provides that the said ORP of the phosphate chemical treatment bath is equal to or greater than 770 mV~~ 770 mV to 960 mV.

5. (Currently Amended) The electrolytic phosphate chemical treatment method according to claim 1, ~~wherein an electrode is~~ comprising a second electrode used in the electrolytic treatment for making the ORP of the phosphate chemical treatment bath ~~equal to~~

~~or greater than 770 mV to 960 mV, and wherein said second electrode~~ is an insoluble metal material.

6-7. (Canceled)

8. (Previously Presented) The electrolytic phosphate chemical treatment method according to claim 1, wherein the metal ions that form a complex with the phosphoric acid and the phosphate ions in the phosphate chemical treatment bath are at least one of Zn, Fe, or Mn ions.

9. (Currently Amended) The electrolytic phosphate chemical treatment method according to claim 17, wherein the circulation system is provided by separating the treatment tank into an electrolytic treatment tank that carries out the electrolytic treatment and an auxiliary tank that does not carry out the electrolytic treatment and circulating the treatment liquid of the treatment bath between the two tanks.

10. (Previously Presented) The electrolytic phosphate chemical treatment method according to claim 9, wherein the auxiliary tank that does not carry out the electrolytic treatment has a mechanism in which the treatment liquid is passed through a permeable solid structure.

11. (Original) The electrolytic phosphate chemical treatment method according to claim 10, wherein the solid structure is a film.

12. (Previously Presented) The electrolytic phosphate chemical treatment method according to claim 9, wherein a filter having a mechanism that filters the treatment liquid is used for the auxiliary tank that does not carry out the electrolytic treatment.

13. (Previously Presented) The electrolytic phosphate chemical treatment method according to claim 9, further comprising removing, through a liquid circulation circuit, a portion of the treatment liquid at a location prior to being introduced into a filter material in a

filter, exposing the removed treatment liquid to the atmosphere, and returning it to the electrolytic treatment tank after separating  $\text{NO}_2$  and  $\text{N}_2\text{O}_4$  present in the treatment liquid.

14. (Currently Amended) The electrolytic phosphate chemical treatment method according to claim 9, wherein an oxidation-reduction potential of the treatment bath is equal to or greater than 800 mV. 800 mV to 960 mV.

15. (Previously Presented) The electrolytic phosphate chemical treatment method according to claim 9, wherein the treatment bath is maintained in a constant state by measuring an oxidation-reduction potential value of the treatment bath and changing an amount and/or composition of replenishing chemical corresponding to the change in that value.

16. (Previously Presented) The electrolytic phosphate chemical treatment method according to claim 1, wherein the ORP of said phosphate chemical treatment bath is maintained at 800 mV to 960 mV.

17. (Currently Amended) The electrolytic phosphate chemical treatment method according to claim 1, wherein ~~separating  $\text{NO}_2$  and/or  $\text{N}_2\text{O}_4$  gas from the treatment bath~~ comprises  $\text{NO}_2$  and/or  $\text{N}_2\text{O}_4$  gas is separated from the phosphate chemical treatment bath comprising circulating treatment liquid of the phosphate chemical treatment bath via a circulation system which circulates the treatment liquid under pressure using a pump from a treatment tank to the same, and exposing the treatment liquid to the atmosphere in the circulation system, so that dissolved  $\text{NO}_2$  and/or  $\text{N}_2\text{O}_4$  gas can easily escape from the treatment liquid.